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Abstract

THE ITALIAN ORGANIC REACTOR PROGRAM: PRESENTATION OF THE REACTOR DESIGN AND OF THE ORIGINAL SOLUTIONS GIVEN TO SOME OF THE PROBLEMS PECULIAR TO THIS TYPE OF REACTOR

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The site proposed for the PRO organic reactor is located near the Brasimone lake in a valley on the Appennino Tosco-Emiliano, midway between Bologna and Florence.

In the course of the reactor designing there arose many technical problems, which required original solutions.

The said problems are related to the:

a) reactor core, with particular reference to fuel element choice and to thermal and nuclear design;

b) core instrumentation, including failed fuel element detection and location system, bearing in mind both the fact that the reactor will be used in the benginning for research purposes, and the possibility of installing a data logger;

c) primary loop, with reference to the choice of the most suitable components and to auxiliary systems;

d) fuel element handling, which takes care of all the problems connected with this operation in an organic reactor;

e) shielding design, with particular reference to the choice of materials and accessibility problems;

f) control and start-up of the plant, with reference to the particular solutions adopted.

Since this is the first design completely developed in Italy, special care was taken to choose only components that can be constructed in our country.

In some cases experimental work was required for this purpose.